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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,180	12/30/2005	Shunsuke Sunahara	CSP-116-A	8016
21828 7590 07/24/2009 CARRIER BLACKMAN AND ASSOCIATES 43440 WEST TEN MILE ROAD EATON CENTER NOVI, MI 48375				
EXAMINER MEHTA, MEGHA S				
ART UNIT 1793		PAPER NUMBER		
NOTIFICATION DATE 07/24/2009		DELIVERY MODE ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/537,180

**Applicant(s)**

SUNAHARA ET AL.

**Examiner**

MEGHA MEHTA

**Art Unit**

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 June 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 and 32-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 32-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-85/86)  
Paper No(s)/Mail Date 5/19/2009
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Inventor's Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(c), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(c) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 23, 2009, has been entered.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 32 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. "A method step of plunging portions of the plate material around said end faces thereof" does not have support in the original disclosure.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 32 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how the plate material can be plunged into end faces. For purposes of

examination, the Examiner is interpreting this to mean "a method step of plunging the plunging member into end faces of the plate material".

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 5, 6, 7 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,794,835 Colligan et al in view of US 6,325,273 Boon et al.

Regarding claim 5, Colligan teaches a friction stir welding process for bringing a first end face **1A** and a second end face **1B** of a metal workpiece into abutment against each other, and thereafter joining said first end face and said second end face to each other with a rotating friction stir welding tool, wherein when a first end having said first end face is present on a retreating side and a second end having a second end face is present on an advancing side (figure 5C), a workpiece plunging member **18** having a substantially circular cross section (column 3, lines 48-59), which is disposed on a tip end of said friction stir welding tool.

Colligan does not teach the displacement of the tool. Boon teaches a friction stir welding tool in which a probe **11** (figure 4) is plunged with a central region thereof being displaced from a boundary line between said first end face and said second end face to said second end within a range equal to or smaller than the radius of the workpiece plunging member wherein a minimum value of displacement of said workpiece plunging member in said range is greater than 0 (figure 1), where the plunging member can be needle-shaped instead of the crescent-shaped probe

shown in the figures (column 8 lines 28-45). Boon does not teach the exact displacement amount. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to determine the optimum degree displacement for the probe because a larger displacement creates a wider weld. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation,” (MPEP 2144.05 Section II).

It would have been additionally obvious to one of ordinary skill in the art to include the probes and the displacement of Boon in the method of Colligan because this creates a wider weld with a larger penetration area (column 5, lines 45-47).

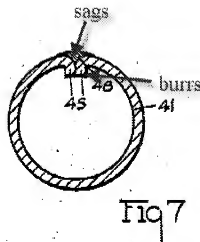
Regarding claim 6, neither Colligan nor Boon teaches the exact displacement amount of one-half of the radius. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to determine the optimum degree displacement for the probe because a larger displacement creates a wider weld. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation,” (MPEP 2144.05 Section II). It would have been additionally obvious to one of ordinary skill in the art to include the probes and the displacement of Boon in the method of Colligan because this creates a wider weld with a larger penetration area (Boon column 5, lines 45-47).

Regarding claim 7, Colligan teaches a workpiece having said first end face and a workpiece having said second end face are separate from each other and are made of a chief component comprising the same metal (column 3, line 66 – column 4, line 2), where both plates comprise aluminum.

Regarding claim 11, Colligan teaches that each of the first and second end faces comprise a finger, which forms protrusions along a joining direction of said first and second end faces when said first and second end faces are brought into said abutment (figure 3).

8. Claims 8, 9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2,148,714 Urschel in view of US 5,794,835 Colligan et al.

Regarding claim 8, Urschel teaches a welding process for bringing a first end face and a second end face of a metal workpiece 45 having a curved surface into abutment against each other to form abutting regions, and then welding the abutting regions to join said end faces to each other, wherein said first end face and said second end face have burrs projecting in a thickness direction of said metal workpiece, and sags projecting in a direction transverse to said thickness direction, shown in the figure to the right (figure 7), when said abutting regions are formed, said sags of said first end face and said second end face are disposed in confronting relation to each other and



Sags and burrs shown in figure 7

positioned on a surface of an outer circumferential wall of said curved surface, and said burrs are positioned on a surface of an inner circumferential wall of said curved surface, wherein said outer circumferential wall is longer than the inner circumferential wall and wherein the abutting regions are welded (page 1, column 2 line 58 – page 2, column 1, line 6 and figure 7). The outer wall and the inner walls are measured to the end of the plates, that is the ends of the flanges 45.

Urschel does not teach friction stir welding. Colligan teaches a method of joining workpieces by friction stir welding where a plunging member of a friction stir welding tool is plunged into the outer wall surface and thereafter said friction stir welding tool is moved to scan said abutting regions (column 3, lines 48-59). It would have been obvious to include the friction stir welding of Colligan in the process of Urschel at the time of the invention because friction stir welding creates a strong, good quality weld.

Regarding claim 9, Urschel teaches said first end face and said second end face are present on the same metal workpiece, and said abutting regions are provided by curving said metal workpiece to bring said first end face and said second end face into abutment against each other (figure 7).

Regarding claim 12, Colligan teaches that each of the first and second end faces comprise a finger, which forms protrusions along a joining direction of said first and second end faces when said first and second end faces are brought into said abutment (figure 3). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the protrusions of Colligan in the method of Urschel because this allows the imperfections at the beginning and the end of the weld to be removed from the product (column 8, lines 19-27).

9. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,794,835 Colligan et al in view of US 2,740,877 Knauth et al.

Regarding claim 1, Colligan teaches a method of manufacturing a body comprising the steps of bringing end faces of a plate material **1A**, **1B**, the plate material having fingers **12**, **14** projecting from corners along a joining direction (figure 3), into abutment against each other to form protrusions projecting along the joining direction with end faces of the fingers, and also to

form a body, friction stir welding abutting regions of the end faces of the plate material to join the end faces to each other, thereby forming a body having said protrusions and removing said protrusions (column 8, lines 19-27) wherein said end faces of the plate material are friction-stir welded such that said abutting region is devoid of a formation of swellings (column 4, lines 57-60).

Colligan does not explicitly teach gripping the protrusions by a gripping member or forming a hollow cylindrical body. Knauth teaches butt welding members (two sheet members or two pipes) using fingers/grippers **17** to grip the edges of the tube during welding (column 1, line 66 – column 2, line 7 and column 6, lines 14-18). It would have been obvious to one of ordinary skill in the art to include the grippers and pipe formation of Knauth in the method of Colligan because the fingers ensure that the workpieces remain stationary and aligned during welding and pipelines are commonly formed by friction stir welding because of the variety of potential applications in fluid transportation. Additionally, it would have been obvious to grip the protrusions of Colligan with the grippers because this would minimize interference with the weld tool during the welding process.

Regarding claim 2, Colligan in view of Knauth teaches a hollow cylindrical body having said protrusions that are pressed from a side of an outer circumferential wall surface thereof when the abutting regions are friction stir welded (Colligan column 3, lines 48-59).

10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,794,835 Colligan et al in view of US 2,740,877 Knauth et al as applied to claim 1 above, and further in view of US 2002/0020164 Cleveland et al.



Regarding claim 3, Colligan in view of Knauth teaches manufacturing the hollow body. Neither Colligan nor Knauth teaches inclining the body while welding. Cleveland teaches a method of friction stir welding hollow cylindrical bodies while said hollow cylindrical body **102** is inclined with respect to a horizontal direction (paragraphs [0026] and [0027]). Figure 8-1 shows an inclined hollow cylindrical body. It would have been obvious to one of ordinary skill in the art at the time of the invention to include the inclination of Cleveland in the method of Colligan and Knauth because workpieces with varying thicknesses would have to be inclined with respect to a horizontal direction in order to obtain a strong, uniform weld.

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,794,835 Colligan et al in view of US 2,740,877 Knauth et al as applied to claim 1 above, and further in view of WO 99/33594 Lawrence.

Colligan teaches friction stir welding, and Knauth teaches forming tubes. Neither Colligan nor Knauth teaches forming a wheel rim. Lawrence teaches friction stir welding a wheel rim that is joined to a wheel disk to produce a vehicular wheel manufactured as said hollow cylindrical body (abstract). Lawrence does not explicitly teach the wheel disk. However, in order to be used in a vehicle, the wheel rim must have a disk. It would have been obvious to one of ordinary skill in the art at the time of the invention to include a wheel rim of Lawrence in the process of Colligan and Knauth because a wider variety of final products allows for a wider variety of possible applications.

12. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,794,835 Colligan et al in view of US 2,740,877 Knauth et al as applied to claim 1 above, and further in view of US 6,325,273 Boon et al.

Regarding claim 10, Colligan in view of Knauth teaches that the step of friction stir welding comprises a method step of plunging the plunging member into end faces of the plate material thereof along the abutment therebetween with a workpiece plunging member having a substantially circular cross section (figure 5C). Neither Colligan nor Knauth teach the displacement of the plunging member. Boon teaches a method of friction stir welding metal workpieces wherein said workpiece plunging member 11 (figure 4) is displaced from a boundary line between said end faces to one of the ends of said plate material within a range less than or equal to a radius of the workpiece plunging member, wherein a minimum value of displacement of said workpiece plunging member in said range is greater than 0 (figure 1), where the plunging member can be needle-shaped instead of the crescent-shaped probe shown in the figures (column 8, lines 28-45). Colligan does not teach the exact displacement amount. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to determine the optimum degree displacement for the probe because a larger displacement creates a wider weld. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation,” (MPEP 2144.05 Section II). It would have been additionally obvious to one of ordinary skill in the art to include the probes and the displacement of Boon in the method of Colligan because this creates a wider weld with a larger penetration area (column 5, lines 45-47).

#### ***Response to Arguments***

13. Applicant's arguments filed June 23, 2009, have been fully considered but they are not persuasive. Applicant argues that the amendment to claim 32 overcomes the 112 rejection. However, the claim, as phrased, and as explained above, suggests that the *plates* are plunged into

the end faces, which are a portion of the plates – and thus, has no support in the original disclosure. Please amend to clarify that it is the *probe* that is being plunged into the plates.

Applicant argues that Colligan fails to teach the displacement as equal to or smaller than the radius of the workpiece plunging member regarding claims 5 and 32. The new reference cited, Knauth, teaches a displaced plunging member in figure 4. See the rejection above.

Applicant argues that Colligan teaches a probe that does not extend completely through the materials. However, this limitation is never claimed, but it is pointed out that Colligan does teach this in figures 5B and 7.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant argues, with respect to claim 8, that gripping the protrusions is not taught. However, this is not claimed in claim 8. Applicant also argues that friction stir welding of the abutting regions is not taught. However, as explained above, this is taught by Colligan.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MEGHA MEHTA whose telephone number is (571)270-3598. The examiner can normally be reached on Monday to Friday 7:30 am to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on 571-272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Megha Mehta/  
Examiner, Art Unit 1793

/Jessica L. Ward/  
Supervisory Patent Examiner, Art Unit 1793